Remarks

Allowance of all claims is respectfully requested. Claims 1-4 & 6-19 are now pending.

By this paper, independent claims 1 & 4 are amended (and new independent claim 14 is added) to more clearly point out and distinctly claims certain aspects of the present invention. These amendments are submitted in a *bona fide* attempt to further prosecution of this application. Support for the amended language can be found throughout the application as filed. For example, reference pages 1, 2, 18-23 & 32-33, as well as FIGS. 10-13 and the supporting discussion thereof. No new matter is added to the application by any amendment presented.

By this paper, independent claim 5 is canceled without prejudice, and is restated as new claim 14, which corresponds in scope to amended claims 1 & 4. In this amended claim, the term "medium" is deleted from the claim. Based on this, reconsideration and withdrawal of the specification objection is requested, as well as reconsideration and withdrawal of the 35 U.S.C. §101 rejection to prior claim 5.

In amended claims 1 & 4, the 35 U.S.C. §112, second paragraph, rejection is also addressed. In particular, amended claims 1 & 4 indicate which node is sending the second message and where the message is being sent. Additionally, how the "locally storage group membership information" is used to determine the "indicia of occurrence of the quick restart" is made clear. Further, the prior characterization of the "sender's membership group" and "the group" is clarified herein to refer to a "membership group" that the one node is a member of prior to a quick restart at the one node. Based on these amendments, reconsideration and withdrawal of the 35 U.S.C. §112, second paragraph, rejection is also requested.

In the Office Action, claims 1-5 were rejected under 35 U.S.C. §102(e) as being anticipated by Sreenivasan et al. (U.S. Patent Publication No. 2002/0049845; hereinafter Sreenivasan). This rejection is respectfully, but most strenuously, traversed to any extent deemed applicable to the amended and new claims presented herewith, and reconsideration thereof is requested.

Before discussing Applicants' invention and the applied art, the state of the art is briefly summarized.

A liveness daemon which stops (on request or due to a problem) and is then quickly restarted offers a chance for inconsistency to occur. In order to best appreciate this phenomenon, consider the following sequence of events which occurs when a daemon is stopped and then quickly restarted:

(1) the daemon at Node A is stopped;

(2) the daemon at Node A restarts and, for each local adapter, initiates sending "PROCLAIM" messages;

(3) the other nodes still consider Node A as part of the previous group. This situation continues until Node A is detected as dead on each of the AMGs due to lack of "HEARTBEAT" messages coming from Node A;

(4) Node A is finally detected as dead in each AMG and is expelled from the group; and

(5) Node A is then finally allowed to rejoin each AMG.

The delay in "(3)" causes the following problems:

(1) reintegration of the "bouncing" node is seen as occurring too slowly; and

(2) if different networks have very different detection times, it is possible that Node A may be detected as being down and thereafter rejoins one of the groups before being ever detected as down in another network (which has a longer detection time). The net result is that, when node reachability is computed by the other nodes, Node A is never seen as going down at all.

The problem with the scenario in (2) above is that the daemon that restarted starts anew, with no memory of the previous AMG. If other nodes never detect that the node "failed", then they cannot take actions to integrate the node into the higher level node group. (See pages 18 & 19 of Applicants' specification.)

Thus, Applicants recite (e.g., in amended claims 1, 4 & 14) a technique for detecting the quick restart of liveness daemons in a distributed, multinode data processing system in which nodes communicate liveness indicia in the form of heartbeat signals via adapters coupled to each node. The technique includes: subsequent to a quick restart at one node of a membership group, receiving a signal from at least one other node of the membership group at the one node experiencing the quick restart, wherein the quick restart deletes locally stored membership group information at the one node; sending, from the one node to the at least one other node a first message which includes at least indicia of occurrence of the quick restart at the one node, the sending being responsive to receipt of the signal at the one node; and determining from the indicia of occurrence of the quick restart and from locally stored membership group information indicating prior membership of the one node in the membership group, the existence of a quick restart at the one node, and responding thereto by sending a second message from the at least one other node to another node of the membership group which indicates that the one node is to be expelled from the membership group. Applicants respectfully submit that this technique as recited in the independent claims is clearly distinct from the teachings and suggestions of Sreenivasan.

It is well settled that there is no anticipation of a claim unless a single prior art reference discloses: (1) all the same elements of the claimed invention; (2) found in the same situation as the claimed invention; (3) united in the same way as the claimed invention; and (4) in order to perform the identical function as the claimed invention. In this instance, Sreenivasan fails to disclose various aspects of Applicants' invention as recited in the amended claims presented herewith, and as a result, does not anticipate (or even render obvious) Applicants' invention.

Sreenivasan discloses a high availability computing system which includes a plurality of computer nodes (for example, a server system) connected by a first and a second network, wherein the computer nodes communicate with each other to detect server failure and transfer applications to other computer nodes on detecting server failure. The system incorporates methods of maintaining high availability in a server cluster having a plurality of nodes. A group communication service, a membership service and a system resource manager are instantiated on each node and the group communication service, the membership service and the system resource manager on each node communicate with other nodes to detect node failures and to transfer applications to other nodes on detecting node failure. (See Abstract of Sreenivasan.)

Applicants respectfully submit that numerous aspects of their protocol are simply not taught or suggested by Sreenivasan. For example, Applicants recite receiving a signal from at least one other node of the membership group at the one node experiencing the quick restart, and responsive to receipt of the signal, sending from the at least one node to the at least one other node a first message which includes at least indicia of occurrence of the quick restart at the one node. Thus, in accordance with Applicants' invention, protocol is provided for the one node which experiences the quick restart to recognize the discrepancy first, and send a message to the at least one other node of the membership group. No similar facility is believed taught or suggested by Sreenivasan. In paragraph [0109] of Sreenivasan, cited against original claim 1, a node already in the cluster recognizes that another node has been bounced from the cluster.

Further, in accordance with Applicants' recited invention, the at least one other node initially sending the signal to the one node experiencing the quick restart receives the first message and from the provided indicia of occurrence in the quick restart, and from locally stored membership group information indicating prior membership of the one node in the membership group, determines the existence of the quick restart at the one node and responds thereto by sending the second message to another node of the membership group, indicating that the one node is to be expelled from the membership group.

Advantageously, Applicants' recited facility causes the one node experiencing the quick restart to be expelled from the previous membership group as soon as possible. No similar facility is believed taught or suggested by Sreenivasan.

For the above reasons, Applicants respectfully submit that amended independent claims 1 & 4 and new claim 14 patentably distinguish over the teachings of Sreenivasan. Reconsideration and withdrawal of the rejection based thereon is therefore requested.

The dependent claims are believed patentable for the same reasons as the independent claims from which they directly or ultimately depend, as well as for their own additional characterizations. For example, Applicants recite in claims 2, 9 & 15 that the at least one other node sending the second message is the node next in line for receipt of heartbeat signals, with respect to the node that sent the first message. This particular reference to next in line means that the heartbeat passing signal protocol is a ring protocol, as opposed to, for example a star or mesh protocol. A careful reading of Sreenivasan, and in particular, paragraphs [0073], [0078],

[0082], [0089]-[0097], fails to uncover any discussion that the hearbeat signals discussed therein employ a ring protocol for passing of the signals. Without such a protocol, there would be no next in line *per se* from one node to another node during the heartbeat passing of signals. Thus, Applicants respectfully request reconsideration and withdrawal of the rejection to the these claims based on Sreenivasan.

Claims 3, 6, 10, 11, 16 & 17 further characterize the quick restart indicia. Certain of these claims specify that the indicia comprises each of the three listed components. A careful reading of Sreenivasan fails to uncover any teaching or suggestion of the sending of a first message from one node experiencing a quick restart to at least one other node of the one node's prior membership group which contains quick restart indicia, let alone the particular indicia recited in these claims.

Still further, dependent claims 8, 13 & 19 further specify the signal, first message and second message, and thereby the protocol for the fast notification of prior nodes of the membership group of the occurrence of the quick restart at the one node. Again, no similar processing is believed taught or suggested by Sreenivasan.

The application is believed to be in condition for allowance, and such action is respectfully requested.

If a telephone conference would be of assistance in advancing prosecution of the subject application, Applicants' undersigned attorney invites the Examiner to telephone him at the number provided.

Respectfully submitted,

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